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## CLAIMS

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### [Claim(s)]

[Claim 1] It is prepared for mobile communication exchange of a digital mobile radio communication network which fits two or more communication classification and wireless circuit sections of data communications characterized by comprising the following in two or more error correction control systems, A data communication control device which changes a data communication protocol of a communications network to which error correction control by a wireless circuit was performed, and a communications protocol and this wireless circuit in that wireless circuit were connected.

Two or more error correction control modules which perform error correction control according to each of two or more above-mentioned error correction control systems.

Two or more protocol conversion modules which perform data communication protocol conversion according to each of communication classification of two or more above-mentioned data communications, A control means which chooses one of the above-mentioned error correction control modules, and one of the above-mentioned protocol conversion modules according to control information received through the above-mentioned wireless circuit from a moving machine, and carries out insertion connecting in in-series between the above-mentioned wireless circuit and the above-mentioned communications network.

[Claim 2]A data communication control device, wherein two or more above-mentioned error correction control modules and two or more above-mentioned protocol conversion modules are accommodated in a speech path switch which connects the above-mentioned wireless circuit and the above-mentioned communications network.

[Claim 3]An internal switch which has the same function as a speech path switch in a speech path switch which connects the above-mentioned wireless circuit and the above-mentioned communications network is accommodated, and An error correction control module of the above-mentioned plurality [ internal switch / the ], A data communication control device, wherein two or more above-mentioned protocol conversion modules are accommodated.

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## DETAILED DESCRIPTION

### [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention is prepared for the mobile communication exchange of the digital mobile radio communication network which applies two or more communication classification and two or more error correction control systems of data communications, and perform error correction control by a wireless circuit, and. It is related with the data communication control device which performs conversion with the data communication protocol of a wireless circuit, and the data communication protocol of the communications network to which this should be connected.

[0002]

[Description of the Prior Art] The example of composition of the data communications in digital mobile communications is shown in drawing 3. In order to communicate in a figure between the data terminal 12 connected to the digital mobile radio communication network 11, and the data terminal 14 connected to the fixed network 13, In the data communication protocol conversion adaptor 15, the data-communications information 12 on the data terminal 12 is changed into the data communication protocol for wireless circuits suitable for transmission of the wireless circuit 16 which added error correction information. The data-communications information changed into this data communication protocol for wireless circuits is transmitted to the wireless circuit 16 via the digital

moving machine 17. The communication information received through the wireless circuit 16 in the base transceiver station 18 is transmitted to the mobile communication exchange 19, and it is inputted into the data-communication-control circuit 22 via the speech path switch 21 in the exchange station 19. After performing error correction control between non-railroad sections, protocol conversion with the section of the fixed network 13 is performed between the non-railroad sections of data communications. The data-communications information outputted from the data-communication-control circuit 22 can perform transparent data communications between the data terminals 12 and 14 by being sent out to the fixed network 13 and received with the data terminal 14.

[0003]According to under the present circumstances, the classification of data communications, the access speed between non-railroad sections, and communication quality. In order for the data communication protocol conversion adaptor 15 and the data-communication-control circuit 22 to have to prepare the thing of the kind which is different, respectively and to perform normal communication, the data communication protocol conversion adaptor 15 and the data-communication-control circuit 22 must counter by the same kind of things.

[0004]

[Problem(s) to be Solved by the Invention]An error correction control system has two or more kinds, and a data communication protocol has two or more kinds, For this reason, in order to have to prepare the protocol conversion of an adapter, and the data-communication-control circuit of two or more kinds corresponding to an error correction function in the former, When the kind of combination of an error correction control system and data communication protocol conversion increases, the data-communication-control circuit corresponding to the adapter 15 of all the kinds will be installed in all the exchange stations, and there is a problem that immense plant-and-equipment investment is required.

[0005]Then, an object of this invention is to provide the data communication control device which can respond to the adapter of all the kinds by little plant-and-equipment investment by separating the error correction control facility and protocol conversion function of a data-communication-control circuit.

[0006]

[Means for Solving the Problem] Two or more error correction control modules which perform error correction control according to each of two or more error correction control systems according to this invention, Two or more protocol conversion modules which perform data communication protocol conversion according to each of communication classification of two or more data communications are provided, According to control information received through a wireless circuit from a moving machine, one of the error correction control modules and one of the protocol conversion modules are chosen, and both these-chosen modules are inserted in in-series between a wireless circuit and a communications network.

[0007] In an invention of claim 2, two or more error correction control modules and two or more protocol conversion modules are accommodated in a speech path switch which connects a wireless circuit and a communications network, and said direct connection is made. In an invention of claim 3, a speech path switch and an internal switch with same function are accommodated in a speech path switch which connects a wireless circuit and a communications network, and two or more error correction control modules and two or more protocol conversion modules are accommodated in it by the internal switch.

[0008]

[Function] Only the kind of error correcting system respectively used by a wireless circuit, a protocol conversion module is provided only the kind of transmission protocol of data communications, and selective connection of the module of these both kinds is dynamically carried out to an error control module.

[0009]

[Example] An example of the example of this invention is shown in drawing 1, and the same numerals are given to the same thing as the thing in drawing 3. Two or more error correction control modules 25a-25d which correspond to two or more error correction control systems of the wireless circuit section in this example, Conversion with two or more data communication protocols in the wireless circuit section and the data communication protocol of a fixed network and two or more corresponding protocol conversion modules 26a-26c are accommodated in the speech path switch 21 in this example. The error correction module 25a has an error correction control facility corresponding to 11.2k bps data communications, The error correction control module 25b has an

error correction control facility corresponding to 5.6k bps data communications, The error correction control module 25c has an error correction control facility corresponding to 11.2k bps satellite connection data communications, and the error correction control module 25d has an error correction control facility corresponding to 5.6k bps satellite connection data communications. The protocol conversion module 26a has a protocol conversion function corresponding to facsimile communication, The protocol conversion module 26b has a protocol conversion function corresponding to modem communication, and the protocol conversion module 26c has a protocol conversion function corresponding to voice communication.

[0010]As for the data terminals 12 and 14, a facsimile terminal and the wireless circuit 16 explain now as a thing corresponding to the facsimile terminal of the transmission speed of 11.2k bps, and the transmission speed whose wireless circuit of the data communication protocol conversion adaptor 15 is 11.2k bps. When communicating from the data terminal 12 to the data terminal 14 and the data terminal 12 starts communication, the analog data signal from the data terminal 12, After being inputted into the data communication protocol conversion adaptor 15 and changing a facsimile signal into a protocol suitable for transmission of the wireless circuit 16, It changes into the digital data signal which added the error correction control information corresponding to a wireless circuit with a transmission speed of 11.2k bps, and the digital data signal and adapter type information are outputted to the digital moving machine 17. The digital moving machine 17 transmits a digital data signal to the wireless circuit 16, and transmits adapter type information and data-communications start information to the control line 27.

[0011]The base transceiver station 18 sends out the signal from the control line 27 for the signal from the wireless circuit 16 which received to the speech path switch 21 of the mobile communication exchange 19 through the control line 31 through the communication line 28 at the mobile-communication-exchange control device 29 of the mobile communication exchange 19, respectively. The mobile-communication-exchange control device 29 is carried out based on the data-communications start information and adapter type information from the base transceiver station 18, By choosing the error correction control module 25a corresponding to 11.2k bps data communications, and the protocol conversion module 26a corresponding to facsimile communication, respectively, and controlling the speech path switch 21, The speech path path

between the communication line 28 and the error correction control module 25a, The speech path path between the error correction control module 25a and the protocol conversion module 26a, The speech path path between the fixed network circuits 32 which lead to the protocol conversion module 26a and the fixed network circuit 13 is set, respectively, and starting order is sent out to the selected error correction control module 25a and the protocol conversion module 26a corresponding to facsimile communication.

[0012]Thereby, the error correction control module 25a and the protocol conversion module 26a are inserted in in-series between the wireless circuit 16 and the fixed network 13. The error correction control module 25a counters with the data communication protocol conversion adaptor 15, performs the error correction in the wireless circuit section, and sends out the data signal except error correction information to the protocol conversion module 26a. The protocol conversion module 26a changes the communications protocol of the wireless circuit section into the communications protocol of the fixed network 13, and sends it out to the fixed network circuit 32, and the data signal from the data terminal 12 reaches the data terminal 14. On the other hand, the data signal from the fixed-data terminal 14 to the moving terminal 13, After the protocol conversion module's 26a performing protocol conversion and adding error correction information with the error correction control module 25a, communication between both terminals is attained by sending out to the wireless circuit 16, and the adapter's 15 performing the error correction between non-railroad sections, and performing protocol conversion.

[0013]Although this example explained as an example the case where facsimile communication was performed, The adapter which suited the communication method of the modem even if the terminal was a modem etc., By choosing dynamically a protocol conversion module with the conversion function of an error correction control module with the error correction control facility corresponding to it, and the data communication protocol between non-railroad sections, it can respond to any data communication systems.

[0014]With the digital mobile radio communication network 11, as for voice communication, since communication is performed, speech information is also considered to be a kind of data communications by digital data information. Then, by performing audio coding conversion by a

protocol conversion module, it can carry out by the same processing to all the communication methods. At this time, since the adapter 15 is not connected to the digital moving machine 17, the adapter classification of control information is not transmitted from the digital moving machine 17, Voice coding type information is transmitted instead, and the mobile-communication-exchange control device 29 chooses the protocol conversion module which performs voice coding conversion by the received voice coding type information, and realizes it by connecting with a communication line.

[0015]What is necessary is just to add the error correction control module corresponding to it, even if access speed is newly added and an error correction control system is added between non-railroad sections. What is necessary is just similarly, to add the protocol conversion module corresponding to the communications protocol also in the case where a data communication protocol is newly added between non-railroad sections. The important section of the example of an invention of claim 3 is shown in drawing 2, and the same numerals are given to the thing of the same function as drawing 1.

[0016]As for a different place from drawing 1, the internal switch 35 is accommodated by the speech path switch 21, the internal switch 35 has the same function as the speech path switch 21, and the error correction control modules 25a-25d and the protocol conversion modules 26a-26c are accommodated in this internal switch 35. If the mobile-communication-exchange control device 29 is made into the case of drawing 1, and the same example based on the data-communications disclosed information and adapter type information from a base transceiver station, The error correction control module 25a corresponding to 11.2k bps data communications and the protocol conversion module 26d corresponding to facsimile communication are chosen, Set a speech path path as the internal switch 35 so that it may be connected in series and this may be connected to the speech path switch 21, and. The speech path path between the communication line 28 and the internal switch 35 and the speech path path between the internal switch 35 and the fixed network circuit 32 are set, respectively, The error correction control module 25a and the protocol conversion module 26a are inserted in in-series between the communication line 28 and the fixed network circuit 32, and facsimile communication between the data terminals 12 and 14 is performed like the case of drawing 1.

[0017]Although this invention was applied to connection between the data terminal of a digital mobile radio communication network, and the data terminal of a fixed network in \*\*\*\*, it is applicable also to communication with the data terminal of other communications networks, such as not a fixed network but a satellite communication network, and other digital mobile radio communication networks.

[0018]

[Effect of the Invention]As mentioned above, by this invention, only the number of the kinds of adapter is not furnished to an exchange station, but an error correction control facility and a protocol conversion function are separated.

Therefore, with the combination, it becomes possible to decrease the number furnished to an exchange station, and economical efficiency improves.

[0019]There is an advantage of being easily extensible without adding change to a protocol conversion module by adding only the module corresponding to the error correction control facility, even if the error correction control system between non-railroad sections is added. There is an advantage of being easily extensible without similarly, adding change to an error correction control module by adding the module corresponding to the protocol conversion function, even if the data communication protocol between non-railroad sections is added. Therefore, according to this invention, the economical efficiency to equipment of a digital mobile-service switching center can improve, and it can respond to the change in an error correction control system and the data transmission protocol between non-railroad sections easily.

[0020]According to the invention of claim 3, the same technique as usual may be used for control of the speech path switch 21, and it can use the speech path path setting algorithm used conventionally as it is.

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**DESCRIPTION OF DRAWINGS**

[Brief Description of the Drawings]

[Drawing 1] The block diagram showing the example of an invention of claim 2.

[Drawing 2] The block diagram showing the important section of the example of an invention of claim 3.

[Drawing 3] The block diagram showing the conventional data communication control device.

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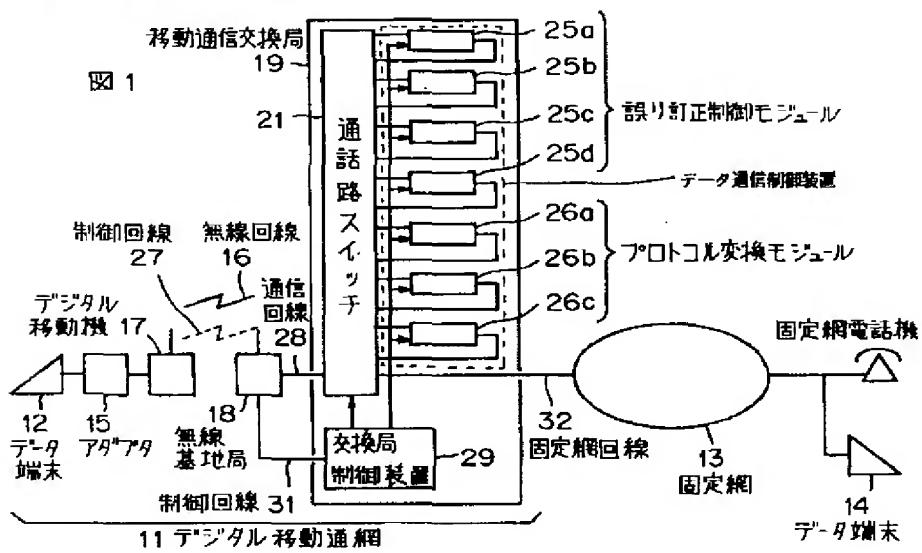
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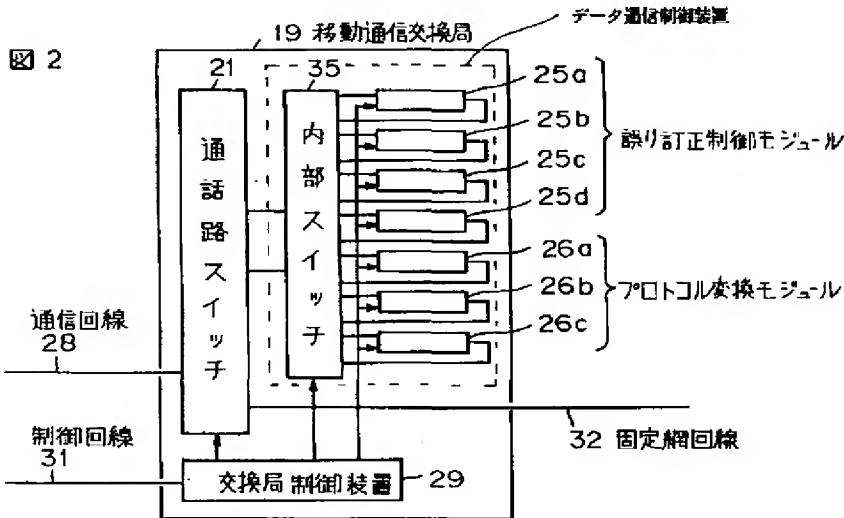
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DRAWINGS

[Drawing 1]

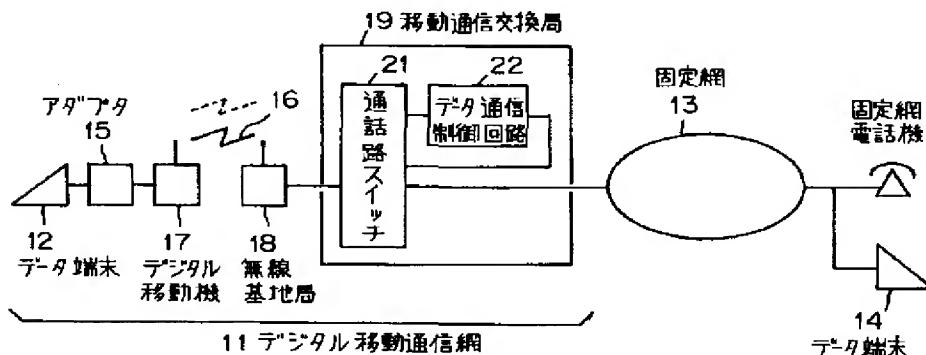


[Drawing 2]



[Drawing 3]

図 3



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